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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/552,133

10/06/2005

Lars-Goran Wistrand

PN0335

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7590

02/16/2010

GE HEALTHCARE, INC.

IP DEPARTMENT 101 CARNEGIE CENTER

PRINCETON, NJ 08540-6231

EXAMINER

PERREIRA, MELISSA JEAN

ART UNIT

PAPER NUMBER

1618

MAIL DATE

DELIVERY MODE

02/16/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/552,133	Applicant(s) WISTRAND, LARS-GORAN	
	Examiner MELISSA PERREIRA	Art Unit 1618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 13-25 are pending in the application. Claims 1-12 were cancelled and claims 19-25 newly added in the amendment filed 10/12/09. Any objections and/or rejections from previous office actions that have not been reiterated in this office action are obviated.

Response to Arguments

1. Applicant's arguments with respect to claims 18-25 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 13-25 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: those necessary for the dynamic nuclear polarization process.
4. Claim 24 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear as to how water can be considered a photolabile organic compound as it does not contain carbon and hydrogen atoms.

New Grounds of Rejection Necessitated by the Amendment

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 13,15-18 and 23-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Gregoli et al. (*Radiation Research* **1982**, 89, 238-254).

7. Gregoli et al. (*Radiation Research* **1982**, 89, 238-254) teaches of the analysis of various DNA samples to reveal total radical yield where pure H₂O radicals and DNA radicals were identified to contribute to the total radical yield (abstract; figure 6; p248, Effect of Hydration; p251-p252, The Frozen State; p239, Routine experimental procedure). The DNA samples comprise DNA constituents (i.e. from calf thymus, *Clostridium perfringens* and *Micrococcus*), water, dissolved O₂ (abstract; p239, paragraph 7); were frozen in liquid nitrogen and subsequently irradiated via γ -irradiation to generate pure H₂O radicals, DNA radicals, etc. (p239, Routine experimental procedure; p240, List of Samples). Gregoli et al. also teaches of an the photolysis of DNA in basic 8 M NaClO₄ glasses in fully deuterated D₂O, NaOD and also performed in H₂O and NaOH (p243, paragraph 3; figure 4).

8. The DNP of the instant claims does not comprise any method steps and therefore the method of Gregoli et al. anticipates the instant claims.

9. The radical of the disclosure anticipates the radical of the instant claims and thus have the same properties and are capable of the same functions, such as decomposing to a non-radical species at temperatures from about 5K to about 273K, etc.

10. Claims 13,17 and 19-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Savitsky et al. (*J. Phys. Chem. A* **2000**, 104, 9091-9100).

11. Savitsky et al. (*J. Phys. Chem. A* **2000**, 104, 9091-9100) teaches of the CIDEP examination of the generation of transient 2-cyano-2-propyl radicals by laser flash photolysis of AIBN (2,2'-azobisisobutyronitrile) in solvents of various viscosities, such as benzene, ethyl benzoate, di-n-butyl phthalate, etc. (abstract; p9092, 2. Experimental Section and 3. Analysis of EPR-Time Profiles).

12. The solvents of the disclosure anticipate the sample of the instant claims and thus have the same properties, such as comprising NMR active nuclei (i.e. ^{13}C) and are capable of the same functions. The radical of the disclosure anticipates the radical of the instant claims and thus have the same properties and are capable of the same functions, such as decomposing to a non-radical species at temperatures from about 5K to about 273K, etc.

13. Claims 13 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Stanislav et al. (*J. Chem. Soc. Perkin Trans.2* **1991**, 835-839).

14. Stanislav et al. (*J. Chem. Soc. Perkin Trans.2* **1991**, 835-839) teaches of the examination of CIDNP during photolysis of uranyl salts of pivalic, propionic and acetic

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acids in D₂O, [²H₆]acetone, [²H₄]methanol or in some solvent. The polarized compounds are formed in the triplet pairs of tert-butyl free radicals (abstract; p836, paragraph 1; scheme 1; conclusion).

15. The D₂O, [²H₆]acetone, [²H₄]methanol of the disclosure anticipate the sample of the instant claims and thus have the same properties, such as comprising NMR active nuclei and are capable of the same functions. The radical of the disclosure anticipates the radical of the instant claims and thus have the same properties and are capable of the same functions, such as decomposing to a non-radical species at temperatures from about 5K to about 273K, etc.

16. Claims 13,17 and 18 are rejected under 35 U.S.C. 102(a) as being anticipated by Bajaj et al. (*J. Mag. Res.* **2003**, 160, 85-90).

17. Bajaj et al. (*J. Mag. Res.* **2003**, 160, 85-90) teaches of DNP of 1-¹³C-glycine dispersed in a frozen 60:40 glycerol/water matrix with a nitroxide radical 4-amino-TEMPO as the paramagnetic dopant generated via microwave irradiation (abstract; p86, paragraph; p87, 4. DNP CP of Static samples; p88, 6.Conclusion; figure 3). Bajaj et al. also discloses DNP examination of U-¹³C, ¹⁵N-proline in a 60% glycerol matrix doped with TEMPO via microwave irradiation (p88, 5. DNP MAS experiments at 9T).

18. The radical of the disclosure anticipates the radical of the instant claims and thus have the same properties and are capable of the same functions, such as decomposing to a non-radical species at temperatures from about 5K to about 273K, etc.

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Claim Rejections - 35 USC § 103

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. Claims 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bajaj et al. (*J. Mag. Res.* **2003**, 160, 85-90) in view of wikipedia glycerol data page, p1-5.

21. Bajaj et al. (*J. Mag. Res.* **2003**, 160, 85-90) discloses DNP of 1-¹³C-glycine dispersed in a frozen 60:40 glycerol/water matrix with a nitroxide radical 4-amino-TEMPO as the paramagnetic dopant generated via microwave irradiation (abstract; p86, paragraph; p87, 4. DNP CP of Static samples; p88, 6. Conclusion; figure 3). Bajaj et al. also discloses DNP of U-¹³C, ¹⁵N-proline in a 60% glycerol matrix doped with TEMPO as via microwave irradiation (p88, 5. DNP MAS experiments at 9T).

22. Bajaj et al. does not disclose freezing of the DNP samples via liquid nitrogen or generation of the radical outside of the DNP magnet.

23. Wikipedia glycerol data page discloses that a 60% glycerol solution freezes at -33.6°C

24. Bajaj et al. teaches that freezing of the DNP samples is sufficiently rapid (Bajaj et al. p87, 4. DNP CP of static samples). Therefore, at the time of the invention it would have been obvious to one ordinarily skilled in the art to freeze a 60% glycerol solution which freezes at -33.6°C, as taught by wikipedia glycerol data page, with liquid nitrogen

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as it is well known in the art that liquid nitrogen can instantaneously supply a freezing temperature sufficient to cause rapid freezing of a 60% glycerol solution.

25. Also, at the time of the invention it would have been obvious to one ordinarily skilled in the art to carry out a reaction outside of a NMR magnet and transfer the reaction to said magnet for examination purposes.

26. The radicals of the disclosure encompass the radicals of the instant claims and thus have the same properties and are capable of the same functions, such as decomposing to a non-radical species at temperatures from about 5K to about 273K, etc.

27. Claims 13-18 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kojima et al. (*Chem. Mater.* **1998**, 10, 3429-3433) in view of wikipedia gamma ray p1-10 and in further view of the combined references of Bajaj et al. (*J. Mag. Res.* **2003**, 160, 85-90) and wikipedia glycerol data page, p1-5.

28. Kojima et al. (*Chem. Mater.* **1998**, 10, 3429-3433) discloses of the photolysis of MBS (sodium 4-[2-(4-morpholino)benzoyl-2-dimethylamino]-butylbenzenesulfonate) (i.e. sample) via a.) mixing MBS into a solution of 1,4-dioxane (i.e. solvent) containing an excess of TEMPO (i.e. radical precursor); b.) irradiation with a super-high-pressure mercury lamp (UV which encompasses the wavelengths of the instant claims) for 7 h until the MBS disappeared (p3430, 2.4 Photolysis; figure 5).

29. Kojima et al. also discloses of the CIDNP spectral analysis and photolysis of the dominant pathway of decomposition of BDMB. In a similar way as BDMB,

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photodecomposition of MBS was investigated using TEMPO as a trapping agent.

(p3431, 3.5 Photolysis of Photoinitiator).

30. Kojima et al. does not explicitly disclose of the CIDNP of MBS or generation of the radical outside of the DNP magnet.

31. At the time of the invention it would have been obvious to one ordinarily skilled in the art to examine the CIDNP spectral analysis of the decomposition pathway of MBS as Kojima et al. teaches of the examination of the dominant decomposition pathway of the MBS precursor BDMB. Also, the CIDNP spectral analysis of the decomposition pathway of MBS can verify the α -cleavage of MBS to produce the benzoyl radical and the α -animoalkyl radical (p3431, 3.5 Photolysis of Photoinitiator).

32. Also, at the time of the invention it would have been obvious to one ordinarily skilled in the art to carry out a reaction outside of a NMR magnet and transfer the reaction to said magnet for examination purposes.

33. The radicals of the disclosure encompass the radicals of the instant claims and thus have the same properties and are capable of the same functions, such as decomposing to a non-radical species at temperatures from about 5K to about 273K, etc.

34. Kojima et al. does not disclose the use of gamma radiation.

35. Wikipedia gamma ray discloses that there is no lower limit to the energy of photons produced by nuclear reactions, and thus UV and even lower energy photons

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produced these processes would also be defined as "gamma rays" (p2, first full paragraph).

36. Therefore, at the time of the invention it would have been obvious to one ordinarily skilled in the art that UV radiation/mercury lamp encompasses the gamma radiation of the instant claims.

37. Kojima et al. does not disclose a frozen DNP sample.

38. Bajaj et al. (*J. Mag. Res.* **2003**, 160, 85-90) discloses DNP of 1-¹³C-glycine dispersed in a frozen 60:40 glycerol/water matrix with a nitroxide radical 4-amino-TEMPO as the paramagnetic dopant generated via microwave irradiation as well as that stated above.

39. wikipedia glycerol data page, p1-5 discloses that stated above.

40. At the time of the invention it would have been obvious to one ordinarily skilled in the art to utilize the frozen 60:40 glycerol/water matrix of Bajaj et al. for the DNP of MBS of Kojima et al. to generate static solids for the increased sensitivity of the DNP experiments (Bajaj et al. p86, paragraph 1).

Conclusion

41. No claims are allowed at this time.

42. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MELISSA PERREIRA whose telephone number is (571)272-1354. The examiner can normally be reached on 9am-5pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Hartley can be reached on 571-272-0616. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael G. Hartley/
Supervisory Patent Examiner, Art Unit 1618

/Melissa Perreira/
Examiner, Art Unit 1618